IN THE CLAIMS:

Please amend the claims as follows:

1. (Withdrawn) An optical branching unit (1) formed on a substrate, the optical branching unit comprising waveguides for guiding light at a predetermined wavelength λ, the waveguides comprising a core region having a refractive index n_{core}, the core region being embedded in a cladding (6) having a refractive index n_{clad}, the waveguides comprising an input waveguide with an input core region (2) of width w_{in} and at least two output waveguides having output core regions (301, 302) of widths $w_{out,i}$, a branching part (4) - having a refractive index n_{core} - for connecting the input and output waveguide cores, a splitting region (7) adjacent to the branching part, the width of the branching part being substantially equal to w_{in} at its joint with the input waveguide core and to the sum of the widths $w_{out,i}$ at its joint with the output waveguide cores, the width of the branching part gradually expanding from its joint with the input waveguide core to allow the output waveguide cores to be branched off and diverge from each other in the splitting region wherein a multitude of M transversal waveguide core elements (5; 501, 502, 503, 504, 505, 506, 507, 508, 509, 510) each having a width w_i, a refractive index $n_{trans,i}$ and being embedded

in said cladding are located in the splitting region forming paths with a mutual centre to centre distance of s_i, said transversal waveguide core elements fully or partially connecting neighbouring output waveguide cores.

2. (Withdrawn) An optical branching unit according to claim 1 wherein opposing edges of neighbouring diverging output waveguide cores meet at the joint with the branching part in a fork or Y-type structure.

3. (Withdrawn) An optical branching unit according to claim 1 wherein said branching part comprises a tapered part joining the input and output waveguide cores, the width of the tapered part being substantially equal to w_{in} at its joint with the input waveguide core and to the sum of the widths $w_{out,i}$ at its joint with the output waveguide cores, and an abutting region, the output waveguide core regions being aligned with and extending from said tapered region and abutting each other in the abutting region.

4. (Withdrawn) An optical branching unit according to claim 1 wherein the optical branching unit has 1 input and 2 output waveguides.

5. (Withdrawn) An optical branching unit according to claim 1 wherein the width w_i of the transversal waveguide core elements decreases with increasing i as the output waveguide cores diverge.

6. (Withdrawn) An optical branching unit according to claim 1 wherein the centre to centre distance s_i between the i'th and the (i+1)'th transversal waveguide core element increases with increasing i as the output waveguide cores diverge or run in parallel.

7. (Withdrawn) An optical branching unit according to claim 1 wherein the transversal waveguide core elements run substantially mutually parallel and perpendicular to the output direction of the optical branching unit.

8. (Withdrawn) An optical branching unit according to claim 1, wherein at least one and preferably all of the transversal waveguide core elements form an uninterrupted path between two neighbouring output waveguide cores.

9. (Withdrawn) An optical branching unit according to claim 1 wherein the cladding (6) comprises lower (61) and upper (62)

cladding layers, the core region (301) of a waveguide being formed in a layer applied to the lower cladding layer (61) supported by the substrate (10) and the upper cladding layer (62) being applied to cover the core region (301) and the lower cladding layer (61).

10. (Withdrawn) An optical branching unit according to claim 9 wherein the upper cladding layer (62) comprises boron and/or phosphorus doped silica glass deposited by plasma enhanced chemical vapour deposition as a succession of individually annealed layers.

11. (Currently Amended) An optical component comprising a combination of planar waveguides on a substrate, each waveguide having a core region pattern surrounded by lower and upper cladding layers and a cross-section having a width, the core region pattern being formed in a layer applied to the lower cladding layer supported by the substrate and the upper cladding layer being applied to cover the core region pattern and the lower cladding layer, the combination of waveguides ~~including spaced,~~ comprising substantially parallel waveguide core sections adjacent to waveguide sections that diverge from said substantially parallel waveguide core sections~~, diverging~~ or the combination of waveguides comprising merging waveguide core sections~~, and~~ comprising a merged

core section, where a width of the merged core section and/or a sum of respective widths of the core sections is substantially constant along said waveguide core sections, said optical component further comprising at least one solid ~~a~~ void reducing or stress reducing structural element located in the vicinity of said ~~spaced, parallel, diverging or merging~~ waveguide core sections.

12. (Previously Presented) The optical component as claimed in claim 11 wherein said structural element includes a stress relieving element.

13. (Previously Presented) The optical component as claimed in claim 12 wherein a minimum distance between a first waveguide and said stress relieving element is smaller than three times a height of said first waveguide.

14. (Previously Presented) The optical component as claimed in claim 12 wherein said stress relieving element is elongate and has a width that is less than or equal to a width of a nearest waveguide.

15. (Previously Presented) The optical component as claimed in claim 11 wherein said structural element includes a plurality of parallel running stress relieving elements.

16. (Previously Presented) The optical component as claimed in claim 15 wherein a distance between neighbouring stress relieving elements is less than 15 μm.

17. (Previously Presented) The optical component as claimed in claim 12 wherein said stress relieving element has width dimensions that are larger than a nearest waveguide.

18. (Previously Presented) The optical component as claimed in claim 17 wherein said stress relieving element has a form that substantially matches the space between two merging or diverging waveguide core sections.

19. (Previously Presented) The optical component as claimed in claim 12 wherein said component is a branching element.

20. (Currently Amended) The optical component as claimed in claim 12 further comprising transversal elements formed in the

waveguide core layer and connecting said ~~spaced, parallel, diverging or merging~~ waveguide core sections.

Claims 21-30. (Canceled).

31. (Previously Presented) The optical component as claimed in claim 11 wherein said structural element includes segmented sections having a number of separate waveguide core pieces.

32. (Previously Presented) The optical component as claimed in claim 31 wherein two spaced waveguide sections form part of an optical coupler with said waveguide core pieces being essentially formed as parallelograms when viewed in a planar cross section.

33. (Previously Presented) The optical component as claimed in claim 31 comprising two spaced substantially parallel waveguide sections wherein cross sections of the two waveguide sections when viewed in a planar cross section are mirror symmetric around an axis midway between the centre axes of the two waveguide sections.

34. (Previously Presented) The optical component as claimed in claim 31 wherein spacing between each waveguide segment in a

direction of intended light transmission of a waveguide section is identical for all segments.

35. (Previously Presented) The optical component as claimed in claim 32 wherein an angle of a parallelogram $90^\circ + \alpha$ defining a waveguide piece as defined by an edge of one waveguide section facing the other waveguide section and the first edge encountered by light propagated in the intended direction of light transmission is larger than 90°.

36. (Previously Presented) The optical component as claimed in claim 35 wherein the angle α is around 8°.

37. (Previously Presented) The optical component as claimed in claim 31 further comprising transversal waveguide core elements between segmented waveguide sections.

38. (Previously Presented) The optical component as claimed in claim 37 wherein the transversal waveguide core elements of a waveguide section are angled compared to an intended direction of light transmission of the waveguide section.

39. (Previously Presented) The optical component as claimed in claim 38 wherein the transversal waveguide elements meet ~~the~~ corresponding waveguide segments at an angle substantially equal to $90-\alpha$.

40. (Previously Presented) The optical component as claimed in claim 37 wherein the transversal waveguide elements are segmented.

41. (Currently Amended) The optical component as claimed in claim 11 wherein said component is a coupler and the combination of waveguides includes a length of at least two spaced waveguide core sections, said structural element including transversal elements arranged between said spaced waveguide core sections, said <u>at least</u> two waveguide sections having, over a certain length, substantially parallel sections that diverge from each other at both ends of the parallel sections.

42. (Previously Presented) The optical component as claimed in claim 41 wherein two spaced waveguide sections are substantially parallel with cross sections of the two waveguide sections and connecting transversal elements, when viewed in a planar cross

section, being mirror symmetric around an axis midway between the centre axes of the two waveguide sections.

43. (Previously Presented) The optical component as claimed in claim 42 wherein the transversal elements of a waveguide section are angled compared to an intended direction of light transmission of the waveguide section to minimize back-reflections.

44. (Previously Presented) The optical component as claimed in claim 43 wherein said spaced waveguide core sections are segmented, each having a number of waveguide core pieces separated by a space filled with upper cladding material.

45. (Currently Amended) A method of manufacturing an optical component having a combination of planar waveguides on a substrate, each waveguide having a core region pattern surrounded by lower and upper cladding layers <u>and a cross-section having a width</u>, the core region pattern being formed in a layer applied to the lower cladding layer supported by the substrate and the upper cladding layer being applied to cover the core region pattern and the lower cladding layer, the combination of waveguides ~~including spaced,~~ <u>comprising substantially</u> parallel <u>waveguide core sections adjacent</u>

to waveguide sections that diverge from said substantially parallel waveguide core sections~~, diverging~~ or the combination of waveguides comprising merging waveguide core sections~~, and~~ comprising a merged core section, where a width of the merged core section and/or a sum of respective widths of the core sections is substantially constant along said waveguide core sections, said optical component further comprising at least one solid ~~a~~ void reducing or stress reducing structural element located in the vicinity of said ~~spaced, parallel, diverging or merging~~ waveguide core sections, ~~said waveguide core sections forming a core region layout in a planar view,~~ the method comprising the steps of:

a) providing a substrate;

b) forming a lower cladding layer on the substrate;

c) forming a core layer on the lower cladding layer;

d) providing a core mask comprising a core pattern corresponding to the core region layout and a layout of said structural elements in the vicinity of said ~~spaced, parallel, diverging or merging~~ waveguide core sections;

e) forming core sections and structural elements using said core mask, a photolithographic and an etching process; and

f) forming an upper cladding layer to cover the waveguide core sections, the structural elements and the lower cladding layer.

46. (Previously Presented) The method as claimed in claim 45 wherein the step of providing a substrate includes providing a silicon substrate, and the core and cladding layers include silica glass.

47. (Previously Presented) The method as claimed in claim 45 wherein the step of forming an upper cladding layer includes forming an upper cladding layer having a lower flow temperature than that of the core and the lower cladding layer.

48. (Currently Amended) The method ~~method~~ as claimed in claim 47 wherein the upper cladding layer is formed including boron and/or phosphorus.

49. (Previously Presented) The method as claimed in claim 45 wherein at least some of the layers on the substrate are formed by plasma enhanced chemical vapour deposition.

50. (Previously Presented) The method as claimed in claim 47 wherein step f) includes successive deposition and annealing steps.

51. (Currently Amended) The method as claimed in claim 45 wherein step e) includes forming said core sections and structural elements that include transversal elements that extend between at least two of said ~~spaced, parallel, diverging or merging~~ waveguide core sections so that said at least two core sections are fully or partially connected by said transversal elements.

52. (Previously Presented) The method as claimed in claim 51 wherein the waveguide core sections that are fully or partially connected by transversal elements are formed to run essentially parallel over a certain length of the waveguides.

53. (Previously Presented) The method as claimed in claim 51 wherein the waveguide core sections that are fully or partially connected by transversal elements are formed to essentially diverge from each other over a certain length of the waveguides.

54. (Previously Presented) The method as claimed in claim 51 wherein at least one of the transversal elements is formed to fully connect two waveguide core sections.

55. (Currently Amended) The method as claimed in claim 45 wherein step e) includes forming said core sections and structural elements that include stress relieving elements in the vicinity of said ~~spaced, parallel, diverging or merging~~ waveguide core sections.

56. (Previously Presented) The method as claimed in claim 55 wherein a flow temperature of the upper cladding layer is adapted so that the waveguide core sections do not flow during an annealing that flows the upper cladding layer.

57. (Previously Presented) The optical component as claimed in claim 19 wherein said branching element is a coupler or a splitter.

58. (Previously Presented) The optical component as claimed in claim 12 wherein said stress relieving element is made of the

same material and in the same process step as the core region patterns.

59. (Previously Presented) The optical component as claimed in claim 12 wherein a minimum distance between a first waveguide and said stress relieving element is smaller than twice a height of said first waveguide.

60. (Previously Presented) The optical component as claimed in claim 12 wherein a minimum distance between a first waveguide and said stress relieving element is smaller than a height of said first waveguide.

61. (Previously Presented) The optical component as claimed in claim 15 wherein a distance between neighbouring stress relieving elements is less than 10 µm.

62. (Previously Presented) The optical component as claimed in claim 15 wherein a distance between neighbouring stress relieving elements is less than 5 µm.

63. (New) An optical component comprising a combination of planar waveguides including input waveguides, output waveguides and a transitions section on a substrate, each waveguide having a core region pattern surrounded by lower and upper cladding layers, the core region pattern being formed in a layer applied to the lower cladding layer supported by the substrate and the upper cladding layer being applied to cover the core region pattern and the lower cladding layer, said component defining a coordinate system in the plane of the substrate with origin in the geometric center of said component, a first axis along an overall direction of light propagation and a second axis perpendicular to the first axis, said component defining two outline curves along outermost waveguides measured along said second axis, said outline curves being a monotonically increasing or decreasing function from the origin of the coordinate system and the combination of waveguides comprising at least one solid void reducing or stress reducing structural element located in a vicinity of said transitions section, said input waveguides and/or said output waveguides.

64. (New) The optical component of claim 63, wherein said planar waveguides comprise segmented waveguide sections comprising one or more gaps so that an outline curve is taken as a curve

comprising said segments and continuously traversing said gaps with curve segments of minimal length.

65. (New) The optical component of claim 63, wherein said outline curves are continuous.

66. (New) The optical component of claim 65, wherein the optical component is a branching unit.

67. (New) The optical component of claim 65, wherein the optical component is a splitter or coupler.

68. (New) An optical component comprising a combination of planar waveguides on a substrate comprising at least one branching unit selected from the group of coupler and splitter, each waveguide having a core region pattern surrounded by lower and upper cladding layers and a width of the transversal cross section, the core region pattern being formed in a layer applied to the lower cladding layer supported by the substrate and the upper cladding layer being applied to cover the core region pattern and the lower cladding layer, said optical component further comprising

at least one solid void reducing or stress reducing structural element located in the vicinity of said branching unit.